SLAC-SL Solar street light controller User Manual

Thank you very much for choosing our product. This product manual provides important information and advices for product installation, use and troubleshooting. Before using this product, please read carefully and thoroughly.

SLAC-SL is specially designed for solar street light with high cost performance. It has a number of outstanding features:

The controller adjusts itself automatically to 12V or 24V system voltage.
Sophisticated programmable nightlight function.
Clear readable LED display of the state of charge.

3 stage charging(boost, equalization, float) for flooded battery, 2 stage charging(boost, float) for sealed battery.

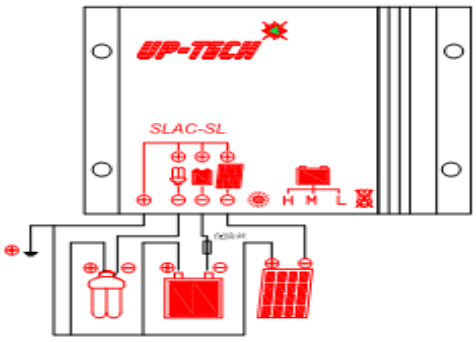
Enclosed by aluminum shell and potted by epoxy with high thermal conductivity. Protection grade reaches IP67.

Safety recommendations

Recommend a wire diameter: SLAC - SL10A: 1.5 mm²; SLAC - SL20A: 2.5 mm ²， ensure the battery and the controller between the cable length as short as possible, to prevent controller misjudge battery voltage.

Connect the controller by following steps to avoid installation faults.

1. Connect the wire to the controller, then to the battery.
2. Connect the wire to the controller, then to the photovoltaic modules.
3. Connect the wire to the load, then to the controller.
4. Disconnect controller in the reverse order.



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Starting up the controller:

Self Test

As soon as the controller is supplied with power either from the battery or the solar array, it starts a self test routine. Then the display changes to normal operation.

System Voltage

The controller adjusts itself automatically to 12V or 24 V system voltages. As soon as the voltage at the time of start-up exceeds 20.0V, the controller assumes a 24V system. If the battery voltage is not within the normal operation range at start-up, a status display according to the section ERROR DESCRIPTION occurs.

LED Status and Display

SLAC-SL Controller has five LEDs. One green LED is for charge display, three yellow LEDs are for the state of charge display, and one red LED is for the status of load display.

Normal operation Description

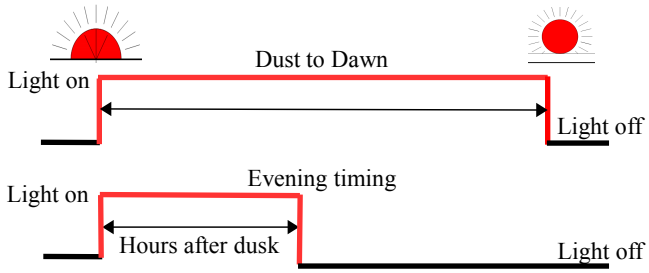
LED	Status	Function
Green LED	On	Normal charge during daytime
	Slow flash	Float charge
	Fast flash	Equalization charge
	Off	Controller connected to battery, night detected.
Yellow	Yellow LED 1(L) on	Battery power low
LED	Yellow LED 2(M) on	Battery power medium
	Yellow LED 3(H) on	Battery power high
Red LED	Off	Normal operation
	Flash	Overload or Short-circuit of load

Error Description

	Indication	Cause	Corrective action
Loads are not supplied.	○○○○●	Battery is low（Red LED on）	Load will reconnect as soon as battery is recharged
	○○○○✸	Over current / Short circuit of loads（Red LED flashing）	Switch off all loads. Remove short circuit. Controller will switch on load automatically after max 1 minute.
	○○◉◉○	Battery voltage too high (>15.5 / 31.0 V)	Check if other sources overcharge the battery. If not, controller is damaged
		Battery wires or battery fuse damaged, battery has high resistance	Check battery wires, fuses and battery. Remove faults.
Battery is low after short time.	○○○○●	Battery has low capacity（Red LED on）	Replace the battery.
Battery is not being charged during daytime.	○○○○●	Solar array faulty or wrong polarity（Green LED off）	Check solar array and wiring. Remove faults.

Nightlight Function

The controller comes with a sophisticated nightlight function. It controls the load output at night and is widely programmable. Two modes are available: Dusk to Dawn and Evening timing.



The mode can be selected in Programming Main Menu 1. If Evening timing mode is selected. Programming Menu 2 allows choosing the Evening timing hours.

The controller recognizes day and night based on the solar array open circuit voltage (Factory setting is 5.0V for 12V system, 10.0V for 24V system). In Programming Main Menu 3 this day/night threshold can be modified according to the requirements of the local conditions and the solar array used.

To find the right value, we recommend measuring the solar array open circuit voltage at the time when twilight has reached the level when the controller should switch on/off. This value can then be set according to the description in the programming section.

Mind that the load output is switched off as soon as the battery has reached the Low Voltage Disconnect threshold, the Low Voltage Disconnect had priority above the nightlight function.

Both state changes require several minutes of continuous transition values before making the change. These restrictions avoid false transitions due to dark storm clouds or lightning.

You can enter the programming mode with 2 seconds push on the button. The programming menu structure is described on the follow page. Mind that once you have entered the programming menu you can exit it at the last item only. Exit with a short push < 1 second. All programming settings are stored in a non-volatile memory and remain stored even if the controller was disconnected from the battery.

Programming your Solar Controller

The button switch has three push modes:

1）Short push Shorter than 1 seconds
2）Long push 2 to 8 seconds
3）Lock out push 8 seconds or longer

By pushing the button for 8 sec in normal operation mode the programming lock-out is activated to prevent any accidental settings change. Another 8 sec push releases the lock-out.

With a long push(2s-8s) , you can enter the programming mode. The programming menu structure is described in the back page. A wide red arrow means a long push (2s-8s), a narrow dotted line arrow means a short push (<1sec).

Testing Function

During the daytime the testing function of SLAC-SL can help the user to verify correct installation or for troubleshooting a system problem. Short pushing the button will light up the lamp which is connected to the load terminals. The lights will be on in the day for 3 minutes intervals. Within 3 minutes the lights can be turned off via pushing button. The lights can turned on repeatedly with pushing button besides when the system is in LVD (load disconnect/red LED on). In LVD this testing function is not valid. If pressing the button cause a load disconnects (LVD) the light will turn off.

Safety Features

	PV terminals	Battery terminals	Load terminals
Reverse polarity	24V system: no 12V system: yes	Protected	Protected
Short circuit	Protected	Protected (with fuse on battery) (3)	Protected
Over current	Protected	Protected	Switches off with a delay (3)
Reverse charge	Protected	No effect	No effect
Over voltage	Max. 55V	Max. 55V	Switches off with a delay
Under voltage	No effect	No effect	Switches off above 15.5/31.0 V
Over temperature	When over temperature occurs, the controller will reduce the charging current. If the temperature of controller reaches a high level, the load will automatically be switched off.		

(1) Controller can protect itself, but load might be damaged.
(2) We strongly recommend that add a fuse between battery and controller. The battery may be permanent damaged when short circuit occurs.
(3) > 200% rated current: Load will be switched off with 3s delay.

Warning: Two or more error conditions at the same time may cause damage to the controller. Always remove the present fault condition before next operation

SLAC-SL Technical Characteristics

Model	SLAC-SL 10A	SLAC-SL 20A
Rated System voltage	12V/24V auto recognition	12V/24V auto recognition
Rated battery charging current	10A	20A
Main charge	14.5V / 29V (25 °C)	14.5V / 29V (25 °C)
Equalization voltage	14.8V/29.6V (25 °C)	14.8V/29.6V (25 °C)
Float charge	13.8V / 27.6V (25 °C)	13.8V / 27.6V (25 °C)
Deep discharge protection, Cut-off voltage	11V – 12 V/ 22V – 24 V	11V – 12 V/ 22V – 24 V
Reconnect level	12.8V/25.6V	12.8V/25.6V
Under voltage protection	10.8V/21.6V	10.8V/21.6V
Overvoltage protection	15.5V/31.0 V	15.5V/31.0 V
Max. charge current	10A	20A
Max. load current	10A	20A
Self consumption	4mA-5mA（12V） 6mA-8mA（24V）	
Max. panel voltage	50V	
Temperature compensation	-4mV/Cell*K	
Grounding	Positive grounding	
Battery type*	Lead acid (GEL, AGM, flooded)	
Evening hours	0 – 12 h	
Ambient temperature	-40°C-+60°C	
Dimensions	50mm*56.6mm*20mm	
Wire Length/size	150mm/2.5m²	
Ambient temperature	-40°C-+60°C	
IP grade	IP67	
Max. altitude	4000m	
Weight	125g	

*) This version is recommended for flooded batteries only, for sealed batteries use our different SLAC-SL version

Subject to change without notice.
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